PA 177.4
No. 63

VANIA DEPARTMENT OF AGRICULTURE

Bureau of Plant Industry

Circular No. 63 Harrisburg March, 1928

Directions for Making Dust Mixtures

Dust mixtures are now successfully used in control of plant pests. These mixtures possess some out-standing advantages over liquid mixtures. They are less troublesome to prepare and apply; and may be kept in a mixed condition in most instances for considerable time; and are less mussy to have about and are not so unsightly when applied to plants. For the sucking insects, such as plant lice, mixtures containing nicotine are used, while some form of arsenic is used for biting insects. For the control of plant diseases the nicotine and arsenic are placed in sulfur or dehydrated copper sulfate either alone or in combination with a carrier, such as hydrated lime, inert clays, calcium sulfate and low grade flour.

METHODS OF MAKING DUST MIXTURES

Various arrangements have been devised for mixing and grinding dust mixtures. The ball machine or some application of its principles is the most satisfactory device known for complete mixing. One arrangement is that of a steel drum turning on the longitudinal axis within which is placed a quantity of round, hard stones (quartz, granite or similar hard stone) about an inch or two in diameter. Such a device not only mixes the material but also reduces it by grinding to a degree of fineness suitable for dusting.

For mixing without grinding six or eight siftings thru a fine sieve will usually give an even mixture. A large tin can with a tight lid and a cylinder of sand cloth about one-half the diameter of the can and about as tall as the depth of the can to be placed within the can will serve as a mixer. This arrangement is operated by shaking and turning. The sieving and the can apparatus are intended for the preparation of small quantities of dust mixtures. For mixing of large amounts (above 50 pounds) the steel drum described above should be used.

STOMACH POISON MIXTURE

For chewing insects, such as the curculio, the mixtures usually consist of powdered arsenate of lead mixed with some carrier. For example, when dusting peach trees, sulfur and hydrated lime are used. In the beginning of the season 90 pounds of sulfur ground to pass thru a sieve 200 meshes to the inch are mixed with 10 pounds of arsenate of lead. In later dustings hydrated lime is usually added, using 80 pounds of sulfur, 10 pounds of lime and 10 pounds of arsenate of lead; the lime not only makes the mixture less expensive, but adds to its blowing quality. The last dust applied in the peach schedule is made of 80 pounds of sulfur and 20 pounds of hydrated lime. Such mixtures are known as 90-10, 80-10-10, etc. (See peach spray program for times of application). Certain plants, such as grape vines, melon and cucumber vines, are badly burned by sulfur. When mixing a dust for such plants use hydrated lime or inert clay as a carrier.

CONTACT DUSTS

For sucking insects, such as aphids, nicotine is the chief material used as the killing agent in dusts. The carriers may be sulfur and lime, lime alone, lime and clay, or clay alone. The choice of carrier will depend upon the nature of the plant to be treated, the time of day the treatment is given, and the probability of disease attack. The liquid nicotine solution of known strength is carefully sprinkled over the carrier, and the carrier and nicotine thoroughly mixed by one of the methods already described.

Arsenate of lead may be added to contact dusts at the rate of one pound to nine of the dust, if it is necessary to combat sucking and chewing insects in a single treatment.

Steps in Preparing a Nicotine-Arsenical Dust

1. Carefully weigh out required amounts of materials to be used.
2. Place all dry materials in vessel used for mixing.
3. Add nicotine by sprinkling the concentrated liquid on the dust materials and at once mix entire lot.

To illustrate: Weigh out 9 pounds of hydrated lime, 1 pound of arsenate of lead and 6 ounces of forty per cent nicotine either free (such as Hall's Free Nicotine) or in the form of sulfate (such as "Black leaf 40" or similar products). Place the hydrated lime and the arsenate of lead in a mixing vessel, sprinkle the nicotine over the surface of the lime and arsenate of lead, then mix them thoroughly. This mixture will do much to control cucumber and melon pests.

Experimental work with contact dust mixtures has shown that different strengths are necessary in order to control the various sucking insects. For example, pear thrips require about two per cent nicotine to give good control while a one per cent mixture is enough for most plant lice. Dust nicotine mixtures should be applied soon after preparation or kept in tight containers until applied. Here is a point which should not be overlooked; where the nicotine in nicotine dust is in the form of the sulfate (as "Black leaf 40") the dust must be applied in the presence of moisture (fact discovered by New Jersey Experiment Station), while with the nicotine in the so-called free form, the dry, hot part of the day gives the best results.

The following table shows the amounts of 40% nicotine solution necessary to make the various strengths of nicotine dusts.

Per cent of Nicotine Desired	Ounces of 40% Nicotine Solution to Use	Pounds of Carrier to Use
½%	2	10
1%	4	10
1½%	6	10
2%	8	10